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| 23373 | 7590 | 08/10/2004 | EXAMINER | |
| SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | NORRIS, JEREMY C | |
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DATE MAILED: 08/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/787,139

Applicant(s)

EN ET AL.

Examiner

Jeremy C. Norris

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-13, 22-26, 32, 37, 38 and 42-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 9-13 and 48-51 is/are allowed.
- 6) ☒ Claim(s) 22-26, 32, 37, 38, 40-42, 45 and 52 is/are rejected.
- 7) ☒ Claim(s) 42, 44 and 46 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>0304</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 9 March 2004 has been entered.

Claim Objections

Claim 44 is objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend from another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claim has not been further treated on the merits.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 32 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). In the present instance, claim 32 recites the broad recitation "the thickness of said conductor circuit is not greater than 10 μ m than the thickness of said conductor layer", and the claim also recites "the thickness of said conductor circuit is substantially the same as the thickness of said conductor layer" which is the narrower statement of the range/limitation.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 22, 23, and 52 are rejected under 35 U.S.C. 102(b) as being anticipated by US 4,642,163 (hereafter Greschner).

Greschner discloses, referring to figures 1A-1F, a printed circuit board comprising a resin insulating substrate board (1) formed with a roughened surface and thereon a conductor circuit (7) comprising at least an electroless plated film, wherein said electroless plated film has a stress of 0 to +10 kg/mm² (see col. 2, lines 40-50) [claim 22], wherein said electroless plating solution is formed from an electroless plating solution comprising tartaric acid or a salt thereof (see col. 6, lines 15-20) [claim 52]

Additionally, Greschner discloses a printed circuit board comprising a resin insulating substrate (1) formed with a roughened surface and built thereon by semi-additive process a conductor circuit comprising at least an electroless plated film (7), wherein said roughened surface comprises concave areas and convex area, and said electroless plated film is complementary to said roughened surface with said electroless plated film in convex areas of said roughened surface being relatively greater in thickness than said electroless plated film in concave area of said roughened surface (see figure 1F) [claim 23].

Claims 24, 32, 37, 38, 40-42, and 45 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,258,094 (hereafter Furui).

Furui discloses, referring to figures 11B-18, a printed circuit board comprising a substrate board (10) formed with a lower layer conductor circuit (25, 65) and built thereon an upper layer conductor circuit (64) through the intermediary of an inter layer resin insulating layer (9), with said upper layer conductor circuit and said lower layer

conductor circuit being interconnected by via holes (42), wherein said upper layer conductor circuit comprises at least an electroless plated film (see col. 5, lines 10-15) said interlayer resin insulating layer is provided with a roughened surface, with said electroless plated film being complementary to said roughened surface, and said interlayer resin insulating layer and said via holes are provided with the same electroless plated film (see col. 5, lines 10-15), with said electroless plated film formed on the bottoms of said via holes having a thickness equal to 50 to 100% of the thickness of said electroless plated film on said interlayer resin insulating layer [claim 24].

Similarly, Furui discloses a multilayer printed circuit board comprising a core board (10) having a conductor circuit (25) and, over said conductor circuit, buildup wiring layers comprising alternating an interlayer resin insulating layer (9) and a conductor layer (64) thereon, wherein the conductor layers are interconnected by via holes (42), wherein said cord board comprises a copper-clad laminate, said conductor circuit comprises a copper foil of said copper-clad laminate and a plated metal layer (65), wherein the thickness of said conductor circuit (see col. 4, lines 25-45) is not greater by more than 10 μ m than the thickness of said conductor layer on said interlayer resin insulating layer (see col. 5, 10-15), wherein the thicknesses are substantially equal [claim 32].

Moreover, Furui discloses, a multilayer printed circuit board comprising a core board (52) and on both sides thereof buildup wiring layers comprising alternating an interlayer resin (9) and a conductor layer thereon (62, 63, 64, 65) wherein said conductor layers are interconnected by via holes (42), wherein said core board is

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provided with plated through holes (5) said via holes are formed immediately over said plated through holes in the manner of plugging the through holes in said plated through holes and are interconnected with said plated through holes [claims 37, 40, 41, 42], wherein the through holes have a diameter of not more than 200 μm [claim 38], wherein the valleys of said via holes are filled with a conductive paste [claim 45]

Claims 25 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,589,255 (hereafter Suzuki).

Suzuki discloses, referring to figure 1C, a printed circuit board comprising a resin insulating substrate board (2) and thereon a conductor circuit (3) comprising at least an electroless plated film (see col. 6, lines 35-40), wherein said electroless plated film is a copper film and comprises one metal species selected from the group consisting of nickel, iron and cobalt (see col. 4, lines 5-10) [claim 25], wherein the proportion of said at least one metal species selected from the group consisting of nickel, iron and cobalt is 0.1 to 0.5 weight % (see col. 3, lines 50-60) [claim 26] .

Allowable Subject Matter

The indicated allowability of claims 22-26, 32, 37, 38, 40-42, 44, 45, and 52 is withdrawn in view of the newly discovered reference(s) as noted above. Rejections based on the newly cited reference(s) are as stated above.

Claims 9-13 and 48-51 are allowed.

Claims 43 and 46 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: Claims 9, 11, and 12 state the limitation "wherein said copper film comprises an electroplated layer and has properties that (a) its crystallinity is such that the X-ray diffraction half-width of the (331) plane of copper is less than 0.3 deg". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. Claim 43 states the limitation "which comprises bumps formed immediately above said plated through holes". This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art. Claim 46 states the limitation "wherein valleys of said lower-layer via holes are filled with a resin. This limitation, in conjunction with the other claimed limitations was neither found to be disclosed in, nor suggested by the prior art.

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeremy C. Norris whose telephone number is 571-272-1932. The examiner can normally be reached on Monday - Friday, 9:30 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamand Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JCSN


DAVID ZARNEKE
PRIMARY EXAMINER
8/9/04